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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/491,585	01/25/2000	Takuya Noguchi	49543(904)	8721

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EDWARDS & ANGELL, LLP
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BOSTON, MA 02205

EXAMINER

QI, ZHI QIANG

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 03/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/491,585	Applicant(s) NOGUCHI ET AL.8	
	Examiner Mike Qi	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6/2/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on Nov.20, 2003 has been entered.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant admitted prior art (AAPA) in view of US 5,537,235 (Ishihara et al) and US 4,526,818 (Hoshikawa et al).

Claims 1, 2 and 12, AAPA discloses (page 2, lines 9 -19) that a liquid crystal display device having two insulating substrates bonded to each other via a sealing material, and liquid crystal is filled into a gap between the substrates.

AAPA does not expressly disclose that a cell gap is formed so as to gradually and continuously increase from a center to an end of a display area at room

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temperature to eliminate the irregular color display at a high temperature due to the thermal expansion coefficients difference between the liquid crystal and the sealing material.

However, Ishihara discloses (col.8 line 30 – col.9, line 26; Figs.4A, 4B) that a gap between the electrodes (32a, 32b) at an edge portion (52) of a displaying portion (50) of the liquid crystal display apparatus is increased gradually to prevent development of unevenness in display at the edge portion, which caused by the temperature increased at the edge portion, and the substrates (31a, 31b) have a larger gap at its peripheral portion (53) than at its middle portion (51) and such that the gap is gradually increased at the edge portion (52) of displaying portion (50). Ishihara discloses the same principle as this application claimed so as to eliminate the unevenness display including the irregular color display caused by the temperature increased.

AAPA discloses (page 4, line18 – page 6, line 4; Figs. 13-14; Table 1) that the coefficient of thermal expansion of a liquid crystal (53) is larger by one digit than that of a sealing material (54), so that an expansion amount of the liquid crystal (53) is larger than that of the sealing material (54), and consequently, the center of the liquid crystal cell expands upward and downward, and the cell gap results in an irregular display color. According to this principle, to overcome this kind of upward and downward expansion of the liquid crystal material so as to maintain a uniform cell gap at higher atmospheric temperature, those skilled in the art would use a contrary compensation for the thermal expansion to form the cell gap gradually and continuously increase from the center to the end of the display area at room temperature, so that the liquid crystal

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material would expand upward and downward to compensate the thermal expansion effect at the higher atmospheric temperature, therefore, maintaining a uniform cell gap at a higher atmospheric temperature.

Ishihara discloses the cell gap is increased gradually at the edge portion of the display area, but Ishihara does not expressly disclose the cell gap is increased gradually and continuously from a center to an end of a display area at room temperature.

However, Hoshikawa discloses (col.8, line 27 – col.9, line 43; Fig.8) that using flexible material such as plastic film to form curved substrates (using at least one flexible substrate having a curvature so as to create a liquid crystal panel of uniform thickness) as shown in Fig.8, and that would be the cell gap is increased gradually and continuously from a center to an end of a display area so as to obtain a uniform cell thickness over the entire surface of the display panel when the operating temperature goes higher.

Therefore, it would have been obvious to those skilled in the art to arrange a cell gap is increase gradually and continuously from a center to an end of the display area at room temperature as claimed in claims 1, 2 and 12 for achieving a uniform cell gap over the entire surface of the display panel and eliminating the unevenness display at a higher atmospheric temperature.

3. Claims 3-7 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA, Ishihara and Hoshikawa as applied to claims 1, 2 and 12 above, and further in view of US 6,104,467 (Nakahara et al).

Claims 3-4, Although AAPA, Ishihara and Hoshikawa do not expressly disclose the cell gap is smaller in the center by less than $0.13\text{ }\mu\text{m}$ or $0.08\text{ }\mu\text{m}$ than an average value of the cell gap, but Nakahara discloses (col.2, lines 19-24) that the accuracy of the cell gap uniformity inside the display region exerted on the display quality is especially significant particularly in the case of the STN type liquid crystal display device requiring a surface flatness of not greater than $0.05\text{ }\mu\text{m}$. Therefore, it would have been obvious to those skilled in the art at the time the invention was made to set the cell gap in the center part less than an average value of cell gaps on an end at room temperature less than $0.13\text{ }\mu\text{m}$ or $0.08\text{ }\mu\text{m}$ as claimed in claims 3-4 for achieving the accuracy of the cell gap uniformity.

Claims 5-7, as the explanation of the AAPA above, those skilled in the art would use a contrary compensation for the thermal expansion to form the cell gap gradually increase from the center to an end of the display area at room temperature, such that the liquid crystal material would expance upward and downward to compensate the thermal expansion effect at the higher atmospheric temperature, and maintaining a uniform cell gap at a higher atmospheric temperature; or, on the contrary, to form the cell gap gradually decrease from the center to the end of the display area at a high temperature, such that the liquid crystal material would expance downward and upward to compensate the thermal expansion effect at the room temperature, and maintaining a uniform cell gap at room temperature; and that would be depended on the making process, and that would have been an obvious variation.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange a cell gap gradually increase or gradually decrease from the center to the end of the display area as claimed in claims 5-7 for achieving a uniform cell gap at a higher atmospheric temperature or at room temperature depending on the making process.

Claim 10, Nakahara discloses (col. 1, lines 6-14) that the super twisted nematic (STN) type liquid crystal display device used as a color display requiring high cell gap accuracy, so that using STN liquid crystal as color display device that is a basic requirement, and that would have been at least obvious.

Claim 11, AAPA discloses (col.2, line 1-3) that the operating temperature of the liquid crystal display device generally needs to be set between -20 and 70°C in view of using outdoor or in an automobile. Therefore, it would have been obvious to those skilled in the art at the time the invention was made to set the operating temperature ranges virtually between -20 and 70°C as claimed in claim 11 for the outdoor using or automobile using.

4. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA, Ishihara and Hoshikawa as applied to claims 1, 2 and 12 above, and further in view of US 6,104,467 (Nakahara et al) and US 6,327,011 (Kim).

Claims 8-9, Although AAPA, Ishihara and Hoshikawa do not expressly disclose a glass substrate or a plastic substrate having a thickness of 0.55 mm or less, but Nakahara discloses (col.6, lines 31-32) that the glass substrates are used and plastic substrates also can be used, and that would have been at least obvious. Concerning

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the thickness of the substrates, Kim discloses (col.3, lines 34-35; col.2, lines 56-63) using thickness less than 0.7 mm for the substrates. If the substrates were very thin, the substrates would be very easy to be crack. If the substrates were very thick, the liquid crystal display device would get more weight. Therefore, it would have been obvious to those skilled in the art at the time the invention was made to select a proper thickness for the substrate as claimed in claims 8-9 to use 0.55 mm thickness for the substrates.

Response to Arguments

5. Applicant's arguments filed on Apr.23,2003 have been fully considered but they are not persuasive.

Applicant's **only** arguments are as follows:

1) The references Ishihara and Hoshikawa do not teach, mention or suggest that a cell gap gradually and continuously increases from the center of the display area to the ends of the display area.

3) The references Nakahara and Kim do not teach that the cell gap gradually and continuously increases from the center to the end of the display area.

Examiner's responses to Applicant's **only** arguments are as follows:

1) The reference Ishihara discloses (col.8 line 30 – col.9, line 26; Figs.4A, 4B) that a gap between the electrodes (32a, 32b) at an edge portion (52) of a displaying portion (50) of the liquid crystal display apparatus is increased gradually to prevent development of unevenness in display at the edge portion, which caused by the temperature increased at the edge portion, and the substrates (31a, 31b) have a larger

gap at its peripheral portion (53) than at its middle portion (51) and such that the gap is gradually increased at the edge portion (52) of displaying portion (50). Ishihara discloses the same principle as this application claimed so as to eliminate the unevenness display including the irregular color display caused by the temperature increased.

AAPA discloses (page 4, line18 – page 6, line 4; Figs. 13-14; Table 1) a conventional art that the coefficient of thermal expansion of a liquid crystal (53) is larger by one digit than that of a sealing material (54), so that an expansion amount of the liquid crystal (53) is larger than that of the sealing material (54), and consequently, the center of the liquid crystal cell expands upward and downward, and the cell gap results in an irregular display color. According to this principle, to overcome this kind of upward and downward expansion of the liquid crystal material so as to maintain a uniform cell gap at higher atmospheric temperature, those skilled in the art would use a contrary compensation for the thermal expansion to form the cell gap gradually and continuously increases from the center to the end of the display area at room temperature, so that the liquid crystal material would expanse upward and downward to compensate the thermal expansion effect at the higher atmospheric temperature, therefore, maintaining a uniform cell gap at a higher atmospheric temperature.

Hoshikawa discloses (col.8, line 27 – col.9, line 43; Fig.8) that using flexible material such as plastic film to form curved substrates (using at least one flexible substrate having a curvature so as to create a liquid crystal panel of uniform thickness) as shown in Fig.8, and that would be the cell gap is increased gradually and

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continuously from a center to an end of a display area so as to obtain a uniform cell thickness over the entire surface of the display panel when the operating temperature goes higher.

2) The references Nakahara and Kim are secondary references, and disclose about the cell gap thickness wherein the accuracy of the cell gap uniformity inside the display region exerted on the display quality is especially significant particularly in the case of the STN type liquid crystal display device requiring a surface flatness of not greater than 0.05 μm ; and the substrate thickness is less than 0.7 mm requirement.

Remarks

6. If Applicant wants to set up an interview, please call for an appointment.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299. The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi
February 26, 2004



TARIFUR R. CHOWDHURY
PRIMARY EXAMINER



11-24-03

RCE/2800

Practitioner's Docket No. 49,543RCE (70904)
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: T. Noguchi, et al. Confirmation No. 8721
Application No.: 09/491,585 Group No.: 2871
Filed: January 25, 2000 Examiner: Qi, Zhi Qiang
For: LIQUID CRYSTAL DISPLAY DEVICE

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATION UNDER 37 C.F.R. 1.10*
(Express Mail label number is mandatory.)

I hereby certify that this correspondence and the documents referred to as attached therein are being deposited with the United States Postal Service on this date November 20, 2003 in an envelope as "Express Mail Post Office to Addressee," mailing Label Number EV 342619518 US addressed to Box: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Eileen M. Woodbury
(type or print name of person mailing paper)
Eileen M. Woodbury
Signature of person mailing paper

REQUEST FOR CONTINUED EXAMINATION (RCE)
(37 C.F.R. 1.114)

1. Applicant hereby requests continued examination, in accordance with 37 C.F.R. Section 1.114, for the above identified application.

TIME REQUEST IS BEING MADE

2. This request is being submitted (check appropriate item(s) below):

- i. ☒ Prior to abandonment of the application
- ii. ☐ Payment of the issue fee
 - ☐ Prior to payment of issue fee
 - ☐ Issue fee has been paid but a petition under Section 1.313 has been granted
- iii. ☐ Prior to a decision on appeal to the Board of Patent Appeals & Interferences
 - ☐ A notice is being separately sent to the Board of Patent Appeals & Interferences that this Request for Continued Examination is being filed.

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11-20-03

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SUMMARY OF THE CLAIMS

Claims 1 and 2 (currently amended)

1. (Twice Amended) A liquid crystal display device, comprising:
a pair of insulating substrates bonded via a sealing material, and
liquid crystal filled between said pair of insulating substrates,
wherein a cell gap is formed so as to gradually and continuously increase from a center to
an end of a display area at room temperature.
2. (Twice Amended) A liquid crystal display device, comprising:
a pair of insulating substrates bonded via a sealing material, and
liquid crystal filled between said pair of insulating substrates,
wherein a cell gap is formed so as to gradually and continuously increase from a center to
an end of a display area at room temperature in a range of the cell gap that no irregular
display color appears.

Claims 3-7 (original)

3. The liquid crystal display device as defined in claim 1, wherein in said display area, a cell gap is smaller in the center by less than $0.13\mu\text{m}$ than an average value of cell gaps on an end at room temperature.
4. The liquid crystal display device as defined in claim 1, wherein in said display area, a cell gap is smaller in the center by $0.08\mu\text{m}$ or less than an average value of cell gaps on an end at room temperature.
5. The liquid crystal display device as defined in claim 1, wherein a cell gap is formed so as to gradually increase from the center to an end of said display area at room temperature, and a cell gap is formed so as to gradually decrease from the center to the end of said display area at a high temperature.

6. The liquid crystal display device as defined in claim 3, wherein a cell gap is formed so as to gradually increase from the center to an end of said display area at room temperature, and a cell gap is formed so as to gradually decrease from the center to the end of said display area at a high temperature.

7. The liquid crystal display device as defined in claim 4, wherein a cell gap is formed so as to gradually increase from the center to an end of said display area at room temperature, and a cell gap is formed so as to gradually decrease from the center to the end of said display area at a high temperature.

Claims 8 and 9 (currently amended)

8. (Amended) The liquid crystal display device as defined in claim 1, wherein each of said pair of ~~said~~ insulating substrates is a glass substrate having a thickness of 0.55mm or less.

9. (Amended) The liquid crystal display device as defined in claim 1, wherein each of said pair of ~~said~~ insulating substrates is a plastic substrate having a thickness of 0.55mm or less.

Claims 10-11 (original)

10. The liquid crystal display device as defined in claim 1, wherein said liquid crystal display device is an STN liquid crystal display device.

11. The liquid crystal display device as defined in claim 10, wherein an operating temperature ranges virtually between -20°C and 70°C.

Claim 12 (currently amended)

12. (Twice Amended) A liquid crystal display device, comprising:
a pair of insulating substrates bonded via a sealing material, and
liquid crystal filled between said pair of insulating substrates,

wherein a cell gap is smaller in a center than any other part of a display area at room temperature such that a cell gap difference, which increasingly and continuously gets larger with distance from the center, is set at a predetermined amount between the center and an end of said display area at a high temperature in a range of the cell gap that no display defect occurs.

REMARKS

Consideration of this Preliminary Amendment is requested prior to examination of the subject application. No new matter is presented by virtue of this amendment.

Claims 1 through 12 are pending in the subject application. Claims 1-12 stand finally rejected under 35 U.S.C. 103(a). Claims 1, 2, and 12 have been amended.

Amendments to claims 1, 2, and 12 have been made without the intention to surrender any of the equivalents to the subject matter therein.

The Applicants appreciate the Examiner's thorough examination of the subject application. However, the Applicants respectfully request reconsideration of the subject application based on the following remarks.

35 U.S.C. § 103(a) REJECTION

In a Final Office Action, the Examiner rejected claims 1, 2, and 12 under 35 USC 103(a) as being unpatentable over admitted prior art in view of U.S. Patent Number 5,537,235 to Ishihara, et al. ("Ishihara" or the "Ishihara Reference") further in view of U.S. Patent Number 4,526,818 to Hoshikawa, et al. ("Hoshikawa" or the "Hoshikawa Reference"); claims 3-7 and 10-11 under 35 USC 103(a) as being unpatentable over admitted prior art in view of Ishihara and Hoshikawa further in view of U.S. Patent Number 6,104,467 to Nakahara, et al. ("Nakahara" or the "Nakahara Reference"); and claims 8-9 under 35 USC 103(a) as being unpatentable over admitted prior art in view of Ishihara, Hoshikawa, and Nakahara further in view of U.S. Patent Number 6,327,011 to Kim ("Kim" or the "Kim Reference"). The Applicants respectfully traverse these rejections for the reasons provided in greater detail below.

The invention as claimed provides a cell gap that is formed so that, at room temperature, the gap gradually and continuously increases from the center of the display area to the ends of the display area. See, e.g., Specification, page 6, lines 12-18. This arrangement makes it possible to smooth out thermal

expansion differences and, at high temperatures, to prevent a cell gap from being too large at the center of the display area. See, e.g., Id., page 6, line 22 to page 7, line 2. The art cited by the Examiner addresses the thermal expansion difference problem; however, none of the cited references prevent a cell gap from being too large at the center of the display area at high temperatures.

With Ishihara, at room temperature, there is a uniform gap in the middle portion and only at the two edge portions is there a gradual increase in the gap distance. Thus, Ishihara only makes the effects of temperature more uniform is the edge portions. Ishihara does not address the effects of temperature change at the center of the cell. Accordingly, Ishihara does not teach, mention or suggest a cell gap that gradually and continuously increases from the center of the display area to the ends of the display area.

The Applicants re-assert their disagreement with the Examiner's contention that Hoshikawa FIG. 8 discloses a cell gap that increases from a center to an end of the display area. On the contrary, Hoshikawa teaches LCD panels arranged to provide a uniform cell thickness over the entire surface area of the cell. See, e.g., Id., col. 5, lines 14-21; col. 6, lines 64-68; col. 7, lines 42-47; and col. 7, line 67 to col. 8, line 2. Indeed, one of the stated benefits of Hoshikawa is that of a uniform gap thickness. See, e.g., col. 11, lines 39-48. Thus, Hoshikawa expressly teaches away from providing a cell gap that increases gradually and continuously from the center to the end of the display area and is, therefore, improperly relied on by the Examiner in rejecting claims 1, 2, and 12.

FIG. 8 of Hoshikawa merely shows manufacturing substrates 110 and 220 to provide an inward force during assembly. Id., col. 11, lines 59-60. FIG. 9 of Hoshikawa illustrates the finished product (as well as FIGs. 1-6) in which the cell gap is uniform and there is no gradual increase. The arrangement disclosed by Hoshikawa is totally different from the present invention and certainly does not teach a cell gap that increases from the center to an end of the display area.

The Applicants respectfully maintain that the Examiner has not made a prima facie case of obviousness. Ishihara teaches deficiencies in the prior art that are rectified by the invention as claimed. Furthermore, Hoshikawa teaches a uniform cell gap. There is nothing in either reference that suggests,

mentions, teaches or provides motivation to provide an LCD with a cell gap that increases gradually and continuously from its center to the ends.

Accordingly, the Applicants respectfully assert that, claims 1, 2, and 12 are not made obvious by the admitted prior art in view of the Ishihara and Hoshikawa references.

Claims 3-7 and 10-11

The Examiner admits that Nakahara is a secondary reference and, impliedly, the Nakahara reference also cannot make up for the deficiencies of the Ishihara and Hoshikawa references. As provided in our earlier response, Nakahara neither teaches, mentions nor suggests resolving irregular display color of an LCD device resulting from a change in an atmospheric temperature by means of controlling the cell gap distance, and, more particularly, by forming a cell gap between a pair of insulating substrates so as to increase gradually and continuously from the center to the ends of the display area at room temperature.

Accordingly, the Applicants respectfully assert that, claims 3-7 and 10 are not made obvious by the combination of the three references.

Claims 8-9

The Examiner similarly admits that Kim is a secondary reference and, impliedly, the Kim reference cannot make up for the deficiencies of the Ishihara, Hoshikawa, and Nakahara references. Indeed, the Kim reference neither teaches, mentions nor suggests resolving irregular display color of an LCD device resulting from a change in an atmospheric temperature by means of controlling the cell gap, and, more particularly, by forming a cell gap between the pair of insulating substrates so as to increase gradually and continuously from the center to the ends of the display area at room temperature.

Accordingly, the Applicants respectfully assert that, claims 8-9 are not made obvious by the combination of the four references.

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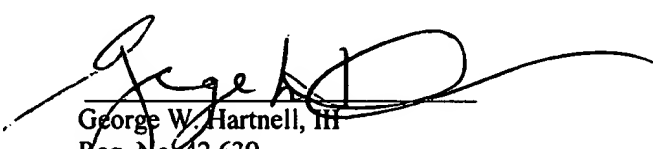
In short, it is respectfully submitted that, claims 1-12 are not made obvious by any of the cited references, and further, satisfy all of the requirements of 35 U.S.C. 100, et seq., especially § 103(a). Accordingly, claims 1-12 are allowable. Moreover, it is respectfully submitted that the subject application is in condition for allowance. Early and favorable action is requested.

The Applicants believe that no additional fee is required for consideration of the within Preliminary Amendment. However, if for any reason the fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge Deposit Account No. **04-1105**.

Respectfully submitted,

Date: November 20, 2003

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